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EFFECTIVE DROP ZONE CONTROL:
A JOINT NECESSITY

by

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Abstract

Current drop zone control doctrine and guidance is inadequate for the warfighter. While current regulations direct procedure, they do not cover the tactics and techniques or the "art" of drop zone control. This has resulted in a deficiency of knowledge among the chief players in the airdrop game, the aircrews and the ground party that supports them. In addition, much of the current guidance is not practical for the battlefield. It is printed in large, heavy manuals that prevent the soldier from taking it with him to the battlefield. This will cause him to rely on notes or memory, degrading his capabilities. Aircrews have certain expectations about the support they should expect on the drop zone but they are not always realized. The bottom line is that aircrews and ground parties need to have interoperability and be working off the same sheet of music.

The first steps in making this happen is to produce a definitive guidance that addresses procedures; tactics and techniques for drop zone control. This guidance must then be issued to aircrew after completing airdrop training, and ground party members after completing drop zone control training. It must be multiservice oriented, so it is applicable across the board. Next, it must be portable. This means it must not be the size of a telephone directory. It should be able to be reduced to a five by seven-inch document that the aircrew can fit in their publication bag and the ground party can keep in their battle dress uniform pocket. This way, they will take it to the battlefield with them and have the information readily available.

This research paper covers the historical and contemporary reasons for improved efficiency in drop zone control, suggests the Air, Land and Sea Application (ALSA) Center as the proponent of this new, multiservice document and provides a general outline and suggested content for it.

Chapter 1

Introduction

In order to make assured conquests it is necessary always to proceed within the rules: to advance, to establish yourself solidly, to advance and establish yourself again, and always prepare to have within your reach of your army your resources and your requirements

—Frederick the Great

The United States Air Force (USAF) and the United States Army (USA) work together every day conducting airdrop missions. Despite this long history and practice, common problems are still arising. While most airdrops are successful, many are not and can be done much better. The common thread in this problem is the misunderstanding by the aircrews that fly the missions and the ground troops that support the mission of each other's capabilities and expectations. The Army drop zone support team does not have a clear understanding of what the airdrop aircraft require to make the drop successful and the aircrews don't understand why support is non-standard and different with each mission. Part of this shortfall is the limited training that the drop zone support teams receive. However, I see the fundamental reason for this misunderstanding is a lack of useful guidance on airdrop techniques, tactics and procedures. Sure, each service has a regulation covering drop zone control but they are not congruent nor complete enough. They tend to cover the mechanics of performing drop zone control but are incomplete when it comes to techniques and procedures.

The question arises, "what change to current guidance is required to more effectively conduct airdrop missions?" I propose that while current Air Force and Army regulations suffice for the procedural aspects of drop zone control, there is no publication covering the "art" of drop zone control. It is these tactics and techniques that cause the most problems on the drop zone. The solution to this problem is to create a multiservice publication which covers not only the procedural aspects of drop zone control, but includes the "art" aspects of tactics and techniques. This will form a foundation of knowledge that the troops can work from which will enhance effectiveness and interoperability. It will also provide a source of reference for troops after they have completed their drop zone control training and are in the field.

This publication is not designed just for the Army drop zone support teams. It will be useful to Air Force aircrews because it will address the capabilities and limitations of the drop zone support they will receive in training and combat. It should become mandatory reading while they are completing their airdrop training and will also be a source of reference when they hit the field.

Air Force aircrews are held to strict scoring standards and any deviations are carefully reviewed. A review board is actually convened if an airdrop is especially bad. The Army, however, is not held to any real standard for airdrop accuracy. As long as the load gets on the ground and is in a position to easily recover the supplies, they're happy. It doesn't matter to them if the score is 50 yards or 500 yards. This creates a dichotomy because if the aircrews are expected to maintain strict standards, they should be provided the best opportunity to achieve a good score. A big part of the accuracy is how well or how poorly the Army drop zone support team sets up the drop zone and its markings.

The basis of experience I've used to identify this problem is a two-year tour at the Joint Readiness Training Center (JRTC), at Fort Polk, Louisiana. There, I was assigned as a Theater Airlift Liaison Officer (TALO) with the 2d Armored Cavalry Regiment as well as an Observer/Controller (O/C) for JRTC rotations. JRTC's mission is to train brigade-sized elements of Army light infantry forces and Special Forces in demanding, realistic and real-time combat operations. The Air Force is an integral player in these rotations, providing airlift, airdrop and close air support to the brigade task force. The brigade is required to depend, almost exclusively, on aerial delivery of everything from meals, ready-to-eat to bulk petroleum.¹ This requires the brigade to secure; survey and control drop zones to receive these supplies. As an O/C, I provided training and feedback to the troops and aircrews who performed these missions.

My paper will first cover some historical precedence for effective drop control and then look at the current and future aspects. Next, I'll cover current guidance for drop zone control and what future guidance should entail. After that, I'll outline the content and organization of the new multiservice publication.

Due to the limitations in length of this research paper, I will only cover the Air Force and Army aspects of drop zone control. I'm not intentionally omitting Marine Corps or Navy requirements and those will need to be addressed in the new multiservice publication also. Drop zone control discussion will also be limited to conventional tactics, techniques, and procedures and not special operations, either Air Force or Army.

Notes

¹ Blodgett, Capt Mark A. "Automating Aerial Resupply Schedules." *Army Logistician, Professional bulletin of United States Army Logistics*. March-April 1996, 19.

Chapter 2

Historical Background of Drop Zone Control

In a normal theater of operations such as Europe, one relies on the five means of transportation in priority-rail, pipeline, inland waterways, and finally air. But here, because of Viet Cong interdiction of the surface means of transportation, we rely on them in reverse order-air first...

—General Frank Osmanski, Chief of Logistics, MACV

The precedence for effective drop zone control has already been set in some of our Nation's greatest military conflicts. The success or failure of the operation has often hinged on the effectiveness of the airdrop and the soldier's ability to control that drop. Not only has the airdrop been necessary for the success of the mission, it has been a matter of life or death. This background study will cover Vietnam, specifically the siege of Khe Sanh, an airdrop mission that occurred during the 100-hour ground war of Operation DESERT STORM, and finally, airdrop operations at the Joint Readiness Training Center. Background on Operation JUST CAUSE, in Panama, is in Appendix B.

The Siege of Khe Sanh

In mid-December 1967, North Vietnamese units began encircling two Marine infantry battalions and artillery battalions at Khe Sanh, South Vietnam, near the Demilitarized Zone. By January 1968, some 15,000 communist troops had cut off all ground supply. Khe Sanh would have to rely on an air bridge to survive.¹

When the fight for Khe Sanh began Air Force transports and Marine aerial tankers were able to land to unload their passengers and cargo. As the tempo of combat picked up, landings became increasingly hazardous until the Marines were calling the transports "mortar magnets" and "rocket bait" because they unfailingly attracted hostile fire as they taxied to the unloading area.² This intense ground fire and poor weather prevented C-130s from landing at Khe Sanh and tactical aircrews began airdropping the vital supplies to the besieged American forces. The C-130s used the container delivery system (CDS) to drop ammunition, food and construction materials to the Marines.³

Initial CDS missions demonstrated the viability of airdrop at Khe Sanh, but two problems were noted. First, airdrop accuracy by the aircrews in bad weather was a major consideration. The Air Force, assisted by the ground controlled approach radar installed at Khe Sanh, solved the accuracy problem. Radar guidance from the ground, and precise timing by the navigator allowed the aircrews to accurately hit the tiny, 300-yard by 300 - yard long drop zone.⁴ The drop altitude was 600 feet and the airspeed 130 knots, with the approach fixed, the aircraft were subjected to enemy ground fire on nearly every drop.⁵ On 17 and 18 February 1968, the circular error average was 83 yards. Unfortunately, the radar, which the aircrews depended on, was destroyed on 19 February so the TQ-10 radar, installed at Khe Sanh to control fighter strikes provided an adequate substitute. The C-130's and C123's that parachuted supplies into Khe Sanh drop zone attained enviable accuracy. The C-130's boasted a circular error average of 110 yards for 496 sorties in good weather and bad. The C-123's made 148 sorties on instruments for an average of 133 yards and 308 sorties in good weather for an average of only 95 yards.⁶

The second problem was the ability of the Marines to recover enough of the bundles to make the missions worthwhile. This required the Marines to provide an adequate drop zone (DZ). The ideal solution was to establish a DZ within the main perimeter, but not enough space was available. With the DZ outside the main perimeter, responsibility for protecting the DZ rested with a battalion of Marines, which, with the engineers, checked each morning for mines planted by enemy under cover of darkness. Because the security of the drop zone was so precarious, the Marines could not leave bundles lying out overnight lest the North Vietnamese seize the chance to plant booby traps on them. Each airdrop had to be cleared from the DZ before the next airdrop began so supplies wouldn't pile up. Marines were short of forklifts and trucks, so this made for a Herculean task because airdrops were coming in every 30 minutes until 1600 hours each day.⁷

The tasks of security and recovery, both critical in effective drop zone control, were performed brilliantly by the Marines and troops in Khe Sanh. The result was that between the end of January and early April of 1968, tactical airlifters delivered 12,430 tons of cargo in 1128 sorties to the defenders of Khe Sanh. This air bridge enabled the base defenders to withstand the assault by the North Vietnamese. According to one historian: "Airlift made possible the allied victory...The defenders of this post were exclusively resupplied by air and withstood the attacks of four North Vietnamese regiments."⁸

Operation DESERT STORM

On August 2nd, 1990, Iraqi forces under the command of Iraqi president Saddam Hussein launched an all-out invasion of the neighboring country of Kuwait. At 0100 local time, divisions of the Iraqi Republican Guards crossed the Iraq-Kuwait border on two separate axes, moving rapidly southward toward Kuwait city in a classic blitzkrieg

operation. The initial assault was coordinated with direct Special Forces attacks on Kuwait City, and helicopter and amphibious assaults at key points of tactical significance. The Persian Gulf war had begun.⁹

The invasion sparked both consternation and action from the leaders of other nations. Within days of the invasion, the United States began a multifaceted effort to achieve a status quo antebellum.¹⁰ After a huge build-up of US and Coalition forces as well as economic sanctions failed to dislodge Iraq from Kuwait, President Bush ordered the commencement of Operation DESERT STORM to remove Iraq from Kuwait by force. On 17 January 1991, DESERT STORM was unleashed with a massive, unparalleled air campaign, assaulting key Iraqi forces and installations with the eventual aim of forcing the complete withdrawal of Iraqi forces from Kuwaiti territory. The ground phase of the operations began on 24 February 1991 and ended exactly 100 hours later in an Iraqi rout.¹¹

Actual airdrop operations were very limited during Operation DESERT STORM, probably because the ground war only lasted 100 hours, but the airdrops that did occur provided some valuable lessons learned. One in particular.

It was 26 February, day three of the ground war, on the Iraq/Kuwait border, north of the Wadi Al Batin. The 2nd Armored Cavalry Regiment was moving fast and furious. The Regimental Support Squadron's S-3, Operations Officer, grabbed his Air Force Theater Airlift Liaison Officer (TALO) and said the Regiment needed an immediate airdrop resupply mission. The S-3 had seen that he was running out of 120mm Armor Piercing Discarding Sabot (APDS) rounds and 155mm Dual Purpose Improved

Conventional Munitions (DPICMS) and could not access his stocks as they were too far behind the main body and stuck in the mud.¹²

The TALO quickly put together a tactical drop zone survey and helped the S-3 send the immediate airlift request through channels. The TALO then called the Airlift Control Center (ALCC) on a secure SATCOM, to give them a "heads-up" that the request was coming. The request was approved and the drop time was scheduled for 0800 hours, 9 hours from the time the request for resupply went in. Load problems eventually pushed that time to 1100 hours.¹³

The TALO made a wise tactical decision to request that the airdrop be a Verbal Initiated Release System (VIRS) drop where he and the ground party would give the aircraft verbal steering commands to the drop zone and call the drop. This was because there was several thousand US and Coalition vehicles in the immediate vicinity of the drop zone. They all had orange VS-17 panels on top of them, the same material the point of impact (PI) marker is made of. The aircraft could easily mistake one as the PI and drop the load on it, endangering lives. Unfortunately, the tactics planners, at the ALCC, did not understand the tactical situation on the battlefield.¹⁴

The tactics shop, in the rear, requested that the TALO mark the PI with a raised angle marker (RAM), smoke, and a signal flash from a mirror. While these are excellent peacetime marking devices, they were not compatible with the situation on the battlefield. In this situation, the TALO was in the best position to decide on the method of drop and he asked for a VIRS. The tactics shop did not prepare the crew for a VIRS drop so they were not ready for one when they arrived at the drop zone.¹⁵

When the two ship of C-130s arrived at the drop zone, the ground party had to contact them on Guard frequency because they were not on the same frequency as the ground party. As a result, the ground party had less than a minute to get the aircraft aligned with the drop zone. The two aircraft, not understanding the intent of the VIRS drop, overflew the drop zone and finally dropped the load 1.5 miles long. The ground party managed to recover 80% of the thirty-two, 2000 pound, container delivery system (CDS) bundles containing the much-needed ammunition.¹⁶

The bottom line was that the mission was successful in spite of the prior coordination. Even though the aircrews were not prepared for the VIRS drop, they were determined not to bring the loads back and they made the right decision to drop on their own.¹⁷

While this single mission probably did not effect the outcome of the ground war, it did provide valuable "lessons learned." The aircrews need to be prepared for any type of airdrop and the planners need to understand that the man on the ground is usually in the best position to decide the method of drop

Joint Readiness Training Center (JRTC)

The JRTC, at Fort Polk, Louisiana, provides the rotational units with tough, demanding, realistic, real-time combat operations against an Opposing Force (OPFOR), in a low to mid intensity conflict. Each exercise lasts a little more than two weeks and is called a rotation. The JRTC conducts ten rotations each year.¹⁸ JRTC is first and foremost a truly joint venture. JRTC operations involve Army light infantry brigade task forces, US Special Operations Forces, and Air Force, Naval and Marine aviation units.¹⁹

JRTC training is designed for battlefield realism and to achieve real world conditions, soldiers are exposed to a wide variety of elements. These include the friction and fog of war, civilians and media on the battlefield, terrorism, reliance on aerial supply, casualty play and tactical rules of engagement. During the exercise, units must rely totally on air delivered supplies and resupply.²⁰

Rotational units are required to conduct aerial resupply to an extent normally not available during home station training. They accomplish this with Container Delivery System (CDS) airdrop, combat off-load (COL), heavy equipment platforms, assault landings, sling load, and free drop. A Memorandum of Agreement (MOA) for training requires each unit to plan to airdrop a minimum of 160 CDS bundles.²¹ This results in 30-40 C-130 airdrop missions over a 6-8 day period.²² Because aerial resupply is the primary method of resupply to the brigade task force, each unit must deploy with a Drop Zone Safety Team Leader (DZSTL) to conduct CDS operations. The DZSTL will conduct tactical surveys of all drop zones (DZ) and is responsible for controlling the airdrop, posting road guards around the drop zone, sweeping the DZ of personnel prior to the airdrop, and submitting reports.²³

As an Observer/Controller (O/C) on JRTC drop zones, I observed and evaluated many airdrop operations. Some were very well done, with competent DZSTLs, who had very good knowledge of airdrop control procedures. Many units, however, were lacking in knowledge of airdrop control procedures and the sheer amount of airdrop conducted at JRTC exposed weaknesses in their combat capability. The problems I observed were in conducting tactical drop zone surveys; radio communications, inadequate equipment, tactics and a general lack of knowledge of basic drop zone procedures.

The first challenge to the DZSTL, at JRTC, is accomplishing a tactical drop zone survey. This is critical to the success of airdrop missions. The aircrew uses this information to mission plan and find the drop zone. If this information is not accurate, the unit doesn't get their resupply mission. Many DZSTLs don't have a real understanding of this procedure because current guidance in this area is inadequate. It usually takes repeated efforts, by the DZSTL, before the tactical survey is approved by the Air Force O/Cs. Sometimes the survey is not completed in time for the first airdrop mission and the O/Cs must take over and control the airdrop at a pre-surveyed drop zone.

The majority of the units do not make any attempt to conduct radio communications with the airdrop aircraft and this is for a variety of reasons. First and foremost it is an interoperability problem because the DZSTL usually doesn't have a UHF (Air Force standard) capable radio and only some Air Force C-130s possess FM (Army standard) radio capability. Next, even if the DZSTL has a UHF capable radio, they are not accustomed to talking to the aircraft because doctrine and training have not been sufficient to make the DZSTL familiar with the communication process. Finally, the DZSTL usually didn't have the foresight to check, through his channels, to see if the airdrop aircraft has a FM radio and request a frequency to talk to him on.

Some of the drop zone equipment kits I saw at JRTC were inadequate to effectively control a drop zone. Many of the raised angle markers (RAM), used to mark the point of impact (PI) were not built to standard. They did not meet the requirement that they be six feet high and six feet wide at the base. Some of the drop zone lights, used to mark the PI at night, were not sufficient also. Simple, D-cell flashlights were substituted for the

brighter field marker lights normally used. This caused problems for the aircrew trying to acquire the PI at night.

The majority of the DZSTLs were unfamiliar with tactical considerations on the drop zone. In a combat situation, the ground party should make every attempt to reduce the signature of the drop zone, to prevent observation and compromise of the impending airdrop by the enemy. At JRTC, the RAM would often be displayed well before the airdrop time-over-target, and its' bright orange color attracted the attention of the OPFOR. At night, drop zone lights would be turned on too early and left on well beyond the conclusion of the drop. Again, this signals the impending airdrop to the OPFOR. Both these habits create other safety problems as well. Display of the pre-arranged PI markings (RAM or lights) signals clearance to drop for the airdrop aircraft. In a fluid combat environment, where there might be multiple drop zones located close together, an airdrop aircraft flying just slightly off course could drop on the wrong drop zone because they acquire standard markings below. Drop zone personnel, recovering supplies from a previous drop, would then be endangered. Quickly recovering and removing airdropped items from the DZ is another way to reduce your signature. Some units failed to do this and OPFOR infiltrators destroyed their supplies before they could remove them from the drop zone.

Finally, there was a general lack of knowledge about drop zone control procedures in some of the units. All the DZSTLs had been through a formal training program so I attributed most of the problems to a lack of recent experience with airdrop operations. One DZSTL, who had graduated from DZSTL School just three weeks prior, could not tell me the aircraft's run-in heading to the drop zone, even though it was clearly printed

on the drop zone survey. Another DZSTL could not tell me what the wind limits were for the type load about to be dropped on his drop zone. Others problems included locating the PI, orienting the RAM correctly, and making the pattern of lights large enough to be seen by the aircraft.

JRTC exercises have shown that we can be successful but we still have room to improve our ability to safely and effectively control airdrop missions. However, we can't let a false sense of security set it in when things go right in the somewhat sterile and static confines of the JRTC exercise area. It is still a training environment. We need to work hard to prepare for success where it really counts, in combat when the bullets are really flying.

Notes

¹ Military Airlift Command Office of History, *Anything, Anywhere, Anytime: An Illustrated History of the Military Airlift command, 1941-1991*. May 1991, 133-134.

² Bernard C. Nalty, *Air Power and the Fight for Khe Sanh*, The USAF Special Studies (Office of Air Force History, USAF, Washington D.C., 1986), 43

³ Military Airlift Command Office of History, *Anything, Anywhere, Anytime: An Illustrated History of the Military Airlift command, 1941-1991*. May 1991, 134.

⁴ Bernard C. Nalty, *Air Power and the Fight for Khe Sanh*, The USAF Special Studies (Office of Air Force History, USAF, Washington D.C., 1986), 47.

⁵ Maj. Jessie Burrow, "Airdrop of Personnel and Equipment in a Hostile Environment; (Maxwell AFB, Ala.: Air Command and Staff College), 18.

⁶ Ibid., 50

⁷ Ibid.

⁸ Military Airlift Command Office of History, *Anything, Anywhere, Anytime: An Illustrated History of the Military Airlift command, 1941-1991*. May 1991, 134.

⁹ Captain Thomas J. Snyder, USAF and Captain Stella T. Smith, USAF, "The War in the Persian Gulf," *The Logistics of Waging War, Volume 2, US Military Logistics, 1982-1993, The End of "Brute Force" Logistics*, 9.

¹⁰ Military Airlift Command Office of History, *Anything, Anywhere, Anytime: An Illustrated History of the Military Airlift command, 1941-1991*. May 1991, 199.

¹¹ Captain Thomas J. Snyder, USAF and Captain Stella T. Smith, USAF, "The War in the Persian Gulf," *The Logistics of Waging War, Volume 2, US Military Logistics, 1982-1993, The End of "Brute Force" Logistics*, 9.

Notes

¹² Major Donald "Guns" Koehler, 3rd Air Force, RAF Mildenhall, England, interviewed by author, 27 January 1999.

¹³ Ibid.

¹⁴ Ibid.

¹⁵ Ibid.

¹⁶ Ibid.

¹⁷ Ibid.

¹⁸ Joint Readiness Training Center (JRTC) homepage, on-line, Internet, 21 Mar 99, available from <http://www.jrtc-polk.army.mil/jrtcex.htm>

¹⁹ Ibid, <http://www.jrtc-polk.army.mil/jreal.htm>

²⁰ Ibid, <http://www.jrtc-polk.army.mil/jreal.htm>

²¹ Joint Readiness Training Center Logistical Information Packet, *Aerial Resupply*, 1 Mar 98, 21-1.

²² Ibid, 22-2.

²³ Ibid, 21-3.

Chapter 3

Combat Airdrop; An Enduring Requirement

In the future, the problem of airdrop should be treated as seriously as the problem of bomb drop.

—The New World Vistas Precision Air Delivery Research Initiative Team

There have been many occasions in combat in the past where it has been impossible to reach troops in contact, with surface transportation, because the ravages of war, weather or perhaps just the physical location of the troops. The areas may be also be out of range of Army organic airlift such as helicopters and the loads required may be bigger than a helicopter can carry. Airlanding of supplies may not be possible because there is nowhere to land or the aircraft may be put in danger if it were to. In these circumstances, supplies have to be airdropped. Nothing has changed. Airdrop still has a future in modern combat.

Combat units carry only the supplies and equipment that they will need until they can be resupplied. Therefore, ground forces need to plan carefully for airdrop. Airdrop resupply operations can be used to extend lines of communication. They are extremely important during the early stages of hostilities because ground lines of communications and forward supply points will be priority targets for the enemy at this time. Later, airdrop will become more important as the speed of advance increases and the depth of the battlefield extends. Airdrop resupply adds flexibility to the distribution system. It

allows the combat commander to take the initiative while reducing the impact of overextending his supply lines. The force structure required to support airdrop resupply operations is highly specialized and it needs to be in place and ready to support airdrop operations when hostilities first erupt.¹

Full Dimensional Operations

The basic tenants of the US Army's Full Dimensional Operations Doctrine are initiative, agility, depth and synchronization. Airdrop supports these tenets and the US Army's Full Dimensional Operations Doctrine recognizes the wartime need for aerial resupply. It allows the combat commander to fulfill his duties while minimizing his concern about supply support or over-extension of the logistics tail. It allows the commander to place forces in greater depth and to maneuver them more effectively. The sustainment imperatives, outlined in Field Manuals (FM) 100-5 and 100-10 are anticipation, integration, continuity, responsiveness, and improvisation. Airdrop supports these imperatives by providing the supply and distribution systems the flexibility to change with the tactical situation.²

Unit Responsibilities

As a rule, the airdrop of supplies and equipment is a joint Army and Air Force effort³. However, the units requesting the airdrop resupply must select, prepare, and secure the drop zone (DZ). It must also control the drop zone in the absence of USAF combat controllers (CCT) or Theater Airlift Liaison Officer (TALO). They must recover supplies and equipment, and recover and provide for the retrograde or destruction of air delivery equipment as the situation dictates.⁴ If CCT or TALOs are available, they can

assume many of the selection of the DZ and control functions so that the Army only has to recover the airdropped and air delivery supplies. However, operations tempo and force drawdown has severely limited the availability of these specialists. The US Army is concerned that sufficient CCT and TALOs will not be available to support the Army's airdrop resupply needs. To prepare for these situations, the Army trains their soldiers on procedures to airdrop supplies to ground forces without the use of CCT or TALOs.⁵ This involves training and certifying US Army troops as Pathfinders and Drop Zone Support Teams (DZST) and Drop Zone Support Team Leaders (DZSTL) so that they will have drop zone control capability organic to their units. Training for drop zone security and drop zone recovery details is also being emphasized.

Combat Resupply Scenario

The following combat resupply scenario demonstrates why precise airdrop planning and effective drop zone control is so important when supporting the troops on the ground.

Emergency Resupply CDS Mission

SITUATION: Friendly forces have made significant progress on the ground, during the night, and have exceeded their announced objective by capturing an enemy base camp. As dawn breaks, a consolidated forward line of own troops (FLOT) has emerged. A small concentration of friendly forces is operating inside a pocket of resistance that is increasing in numbers and converging on their position. Presently this company is in dire need of medical supplies and ammunition. CCT is not available and the closest TALO is up at brigade. As luck would have it, the company executive officer (XO) is Pathfinder qualified and DZSTL trained. He quickly surveys an area to use as a drop zone, which he

can secure with the limited forces on hand, and scrambles to find materials to use as drop zone markings. He manages to find three VS-17 panels, a "space blanket", some yellow smoke flares and a signal mirror. After recording the map coordinates for his drop zone, and determining a suggested run-in heading for the aircraft, he transmits an emergency airlift request to his battalion.

PLANNING: Using a DD Form 1974, Joint Tactical Airlift Request, the battalion S-4 records the important data the XO has sent him. They include the desired mode of resupply; description of needed supplies, point of impact (PI) coordinates, desired time over target (TOT), suggested run-in heading, radio frequencies, and DZ PI markings. All this information is vital for the aircrew in accomplishing the airdrop. The S-4 then transmits the request to the brigade Tactical Operations Center (TOC) where it is received by the brigade TALO. The TALO provides an "airman's" check on the information in the request and then gives it to the brigade S-4. The TALO, using a secure telephone in the TOC, provides advance notification, of the request to the Airlift Coordination Cell (ALCC) over the airlift advance notification/coordination net. Concurrently, the request is passed through Army ground operational channels until it is received by the Joint Force Commander (JFC) airlift request validating authority, who quickly validates the request and passes it to the ALCC. When the ALCC, who bears overall responsibility for planning, coordinating, managing, and executing theater airlift operations within this AOR, receives the request, they provide the necessary planning and coordination for such integrated action as defense suppression. The ALCC then passes the information to the airlift unit's Wing Operations Center (WOC) who will plan, schedule aircrew and aircraft, and launch and recover the actual mission.

MISSION EXECUTION. A C-130 aircrew is alerted for the resupply mission. The situation dictates urgency and preparation is intense. The aircrew is provided with limited intelligence threat briefing, navigation and area charts, expected DZ markings and coordinates and other tactics information by the WOC. The pilots, navigator and loadmaster rush to the aircraft which has been loaded with four A-22 CDS containers, containing the requested medical supplies and ammunition. The bundles had been rushed from a nearby Army division support command (DISCOM) base, where they had been pre-rigged in the event of a situation like this. The C-130 launches with one hour for the 50-minute route to the drop zone. Enroute to the drop zone, the aircrew makes FM radio contact with the ground forces and confirms that the drop information remains the same. Most importantly, the point of impact has not changed. On the DZ run in, the aircrew asks the DZSTL to flash the signal mirror at them to aid in DZ acquisition. At 3 miles out, the aircrew observes the pre-coordinated DZ markings of three VS-17 panels, attached to hood of a truck, inclined at a 60-degree angle towards them. A space blanket is stretched out in front of the panels, furthering the acquisition of the PI. The crew asks the DZSTL to "pop smoke" and the resulting plume gives the navigator an idea of the surface winds. The navigator refines his computed air release point (CARP) to compensate for the wind and the load is released 300 yards short and 100 yards right of the PI. The load exits perfectly and four CDS bundles descend under full canopies. The score is a "PI" with the first bundle landing 20 yards from the truck and VS-17 panels. The aircraft makes his escape on a heading to avoid the most serious threat and the ground forces quickly recover the bundles.

RESULT. Another successful airdrop mission and the chance for the ground forces to continue the fight. Proper planning, execution and drop zone control made it happen.⁶

North Korea: Conflict of the Future?

It is hard to tell where the next conflict will be and when it will occur. This implies that we have to be ready anytime and anywhere. However, one area that has shown signs of potential conflict is the Korean peninsula where a state of war still exists between North and South Korea and US forces have a large presence. We have fought a war there once and hopefully some of the lessons learned there will help us prepare for the next fight.

The Korean peninsula is a classic location where airdrop will be required in a major conflict and history has already given us a preview. During the Korean conflict, as allied forces moved northward, supplies were airdropped and airlanded directly to the combat units, adding to the point to point logistics resupply system already in place. Unfortunately, the limited number of large capacity forward airfields restricted airland operations to the C-46s and C-47s. When the 1st Marine Division was cut off at Chosin Reservoir in November 1950, airdrop was the only means of resupply. In the spring of 1951, when weather turned tortuous Korean roads into streams of mud, airdropped supplies became vitally important. Almost every United Nations (UN) front-line unit at one time or another required resupply by airdrop.⁷ Not much has changed on the peninsula and US forces need to be prepared to conduct airdrop operations there in event of a future conflict.

The topography of the Korean peninsula is difficult and not well suited for combined arms operations and the terrain will favor the defenders. Mountains and rivers severely

restrict cross-country movement, especially by heavy vehicles. There are few all-weather roads, and off-road movement potential is variable by location.⁸ This terrain will limit the number of main supply routes (MSRs) and penalties will be severe when they are blocked or disrupted. Weather and enemy action are only some elements that can effect the MSRs. Refugees flowing from the combat areas can easily congest or block the main avenues. They will be looking for the path of least resistance and will conflict with the lines of communications established by US forces.

After evaluating the terrain and conditions that could be in place during a large scale conflict on the Korean peninsula, any planner can see that airdrop operations may sometimes be the only way friendly forces can receive needed supplies.

Notes

¹ Field Manual (FM) 10-500-1, *Airdrop Support Operations in a Theater of Operations*, 19 June 1991, 1-1

² Ibid.

³ Ibid.

⁴ Field Manual (FM) 10-1, *Quartermaster Principles*, 11 Aug 1994, 17-1

⁵ United States Air Force Airlift Center, Operational Feasibility Test and Evaluation of Marking only the Point of Impact for Container Delivery System Airdrops (Final Report: MAC Project 11-47-86). August 1988, 2

⁶ Ibid., C-2.

⁷ Airlift Concepts and Requirements Agency (ACRA), A Qualitative Intratheater Airlift Requirements Study, 30 November 1985, II-6.

⁸ Operational Analysis Exercise (OPEX) Decision Briefing, *Korean Scenario*, 8 Dec 98.

Chapter 4

The Problem: Current Drop Zone Control Guidance is Inadequate

Those who are possessed of a definitive body of doctrine and deeply rooted convictions based upon it, will be in much better position to deal with the shifts and surprises of daily affairs, than those who are merely taking short views, and indulging their natural impulses as they are evoked by what they ready day to day.

— Winston Churchill

We've established that effective airdrop missions have been an enduring combat requirement and will continue to be so in future conflicts. Therefore, it is imperative that we have the forces trained to accomplish airdrop missions. This important training is not only necessary for the specialized forces like CCT, TALOs and Pathfinders, but it is imperative that units have DZST qualified members in their ranks.

The foundation of this training are the guidance and regulations that will establish and sustain the level of knowledge that is required to complete initial drop zone control training and refresh memories in the field, under the strain of combat. Written guidance must be complete, informative, congruent, interoperable and portable. Currently, this is not the case.

Current Guidance

Currently, the Air Force and Army each have their own regulations that cover drop zone control. For the Air Force it is Air Force Instruction (AFI) 13-217, *Assault Zone Procedures* and the Army has Field Manual (FM) 57-220, *Static Line Parachuting Techniques and Training*. Both regulations are adequate for the basic procedural or "mechanical" aspects of drop zone control, but they both lack information on the tactics and techniques of drop zone control. In addition, they are not standardized when it comes to content, format, and text. Currency is also a problem with changes made to AFI 13-217 not being incorporated into FM 57-220. The office of primary responsibility (OPR) for AFI 13-217 does send changes and updates to the OPR of FM 57-220 and they are incorporated but it takes time. The writers of these regulations do a good job with getting the rules out on the "basics" but it is up to the users in the field to give them feedback so they can produce a product that is useful.

AFI 13-217, *Assault Zone Procedures*

Pros

AFI 13-217 does a great job getting the facts across in a document that is only three chapters and 38 pages long. This makes it portable enough to carry into the field in a drop zone kit. The charts and figures are easy to read and useful. Noteworthy is the figure of Standard DZ Markings (Day and Night). Paragraph 2.11, Standard DZ Markings is straightforward and informative. Standard DZ Size Criteria charts are easy to use and distances are given in both yards and meters. Finally, paragraph 2.24, Drop Zone Survey Information provides very detailed information on how to perform a DZ

survey and fill out the Air Force Form 3823. Paragraph 2.13, Airdrop Communications, gives a detailed explanation of required airdrop communications. The glossary is also superb.¹

Cons

AFI 13-217 lacks information on how to perform and document tactical drop zone surveys (should be updated in the next revision of AFI 13-217). This ability is critical during combat and is used regularly at JRTC and other exercises. While AFI 13-217 includes a Mean Effective Wind Computation Table (10-Gram Balloon) chart, it lacks the 30-Gram Balloon chart.²

FM 57-220, Static Line Parachuting Techniques and Training

Pros

FM 57-220 has a good checklist and equipment list for the DZSTL and includes both the 10 Gram and 30 Gram Balloon Mean Effective Wind Computation Table. Chapter 21, Drop Zone Computations and Formulas is very detailed and easy to follow. Paragraph 22-8 does a good job outlining tactical drop zone surveys³

Cons

The first drawback is that drop zone procedures are buried in one, small part of a six-part document that is over one inch thick and weighs two pounds. The rest of the document is not applicable to drop zone control. Consequently, this document is not very portable and would take up a lot of valuable space when the soldier deploys. It would more than likely be left at home and a great resource would be wasted.

FM 57-220 does not discuss the use or required dimensions of the raised angle marker (RAM), which is the standard DZ point of impact marking for day airdrops. This is a serious omission and I have seen the results of this omission on the drop zone. I've seen many RAMs, used by the Army, which don't meet the standards outlined in AFI 13-217. This causes PI acquisition problems for the aircrew, as they are expecting to see a standard size RAM, and results in a "no-drop" when the navigator cannot see the RAM.

Two other areas of FM 57-220 could be improved. First, the regulation does not include guidance on radio communications with USAF aircraft. This can create problems. Next there is no explanation and instruction on how to complete a full drop zone survey and complete the AF 3823. This has created a common complaint from Air Force tactics shops who review and approve full drop zone surveys conducted by Army personnel. Their submitted surveys tend to need a lot of correcting. Detailed instructions, like those found in AFI 13-217 would alleviate most problems.

Summary

This has been just a cursory compare and contrast look at the two main regulations covering drop zone control for the Air Force and Army. It is evident that there is some work to be done to provide a better product to the warfighter. I propose that the answer lie in a "multiservice drop zone control regulation" that covers not only procedures, but tactics and techniques as well.

Notes

¹ Air Force Instruction (AFI) 13-217, *Assault Zone Procedures*, 1 June 1996, 6, 14, 15, 22, 36.

² Ibid., 13

³ Field Manual (FM) 57-220, *Static Line Parachuting Techniques and Training*, 19 August 1996, Part 5, 22-13.

Chapter 5

The Solution

The organization of men and machines into military forces does not necessarily mean that they are equipped and trained for the accomplishment, if necessary, of decisive action in war. For this, the discipline of a coherent body of thought appears to be indispensable.

—Eugene Emme

The best way to get everyone on the "same sheet of music" is to produce one source document that is applicable to all required users. The solution is a new document entitled *Multiservice Tactics, Techniques, and Procedures for Drop Zone Control*. The procedures from AFI 13-217, *Assault Zone Procedures* and FM 57-220, *Static Line Parachuting Techniques and Training* would be combined to produce the "procedures" section of this new document. Then two more sections, "tactics" and "techniques" would be added to cover the "art" of drop zone control. The result is a directive and informative source document for all drop zone control users.

I need to say here that I'm not advocating eliminating AFI 13-217 or FM 57-220, just using the best features to form the nucleus of the "procedures" section of the new multiservice regulation. AFI 13-217 needs to be maintained because Chapter 3, *Landing Zone Operations*, while not applicable to TALOs or Air Force Drop Zone Control Officers (DZCO), is used by CCT as they are qualified to control assault zones. FM 57-220 would still need to be maintained because the majority of that publication contains

basic and advanced training and techniques for static line parachuting, which while useful for that task, it is not needed by DZSTs or DZSTLs in performing drop zone control duties.

Proponent for the New Multiservice Regulation

To maintain "unity of command"" for this new multiservice regulation, one agency should be the proponent for it. I suggest that the Air, Land, and Sea Application Center (ALSA) be that proponent. Their stated mission is congruent with the intent of this new multiservice regulation. Using inputs from the Air Force, Army, Marines, and Navy, (i.e. OPRs for AFI 13-217 and FM 57-220) they would produce a standardized multiservice drop zone control regulation for all the user services. This paper could be a point of departure for that project. But first, who is ALSA and what products do they produce?

ALSA Mission

ALSA's mission is to rapidly and responsively develop multiservice tactics, techniques and procedures, facilitating joint information exchange and operational solutions across the entire military spectrum.¹

ALSA produces three major products although the majority of their effort is dedicated to producing guidance publications for the warfighter in the form of tactics, techniques, and procedures (TTP) publications. They describe courses of action, provide ways to perform or list steps to accomplish multiservice tasks.² A TTP publication would be perfect for this new, multiservice drop zone control regulation.

Method of Issue and Distribution

To maximize the effectiveness and usefulness of this new publication, it must get into the hands of the users and in a form that is manageable.

Who Gets It?

I submit that this publication be issued to all aircrew during their initial airdrop training as well as maintained in the flying squadrons. Any person, who completes drop zone control training such as TALOs, CCT, Pathfinder, Rangers DZST, DZSTL, and DZCO, should be issued this document. In addition to the primary players above, anyone with a vested interest in drop zone control should have access to this document.

In What Form?

To make this publication effective and useful, it must be in a size and weight convenient to the warfighter. The publication should be produced in the standard 8 1/2 x 11 inches and kept to about a 1/2 inch thick if possible. This will make it portable by the user. In addition, the publication should also be printed in a 5 x 7 inches size for use in the field. This will allow the document to fit easily in a rucksack, the cargo pocket of the battle dress uniform (BDU) or a zippered pocket of a flight suit. This portability will allow the user to take it with him to the aircraft or drop zone and he is more likely to refer to it if it is conveniently located.

Summary

Now that we've determined that we need this new multiservice drop zone control regulation, who gets it and how we'll produce it, we need to decide its' format and content.

Notes

¹ Air, Land, and Sea Application Center, "Producers of tactics, techniques, and procedures for the Joint Warfighter," 16 November 1998, n.p. On-line. Internet. Available from <http://www.dtic.mil/als>

² Ibid.

Chapter 6

Outline and Suggested Content

Any amateur can shove tanks, planes, and infantry around the map; the real business is getting gas, ammunition and spare parts to the people that need them, where they need them...the tail, in the form of logistics will more and more wag the dog...logistics will increasingly become the single greatest impediment to have real combat capability.

—Edgar Ulsamer

This chapter will propose an outline and suggested content for the new multiservice drop zone control regulation. The regulation should consist of, as a minimum, a procedures section, a techniques section, a tactics section, and a capabilities and limitations section.

Procedures

The procedures section will include the best aspects of AFI 13-217 and FM 57-220. It will contain the standard procedures, for drop zone control, that apply to all the services.

Techniques

The techniques section will cover some information and techniques on the importance of effective drop zone marking, for day and night airdrops, as well as radio and communication procedures and coordination procedures and checklists. This is not

meant to be all inclusive and other areas can be covered in the final document, as necessary. This section will also contain a "packing" list for drop zone kits so the user will be prepared to control any type of airdrop.

Effective Drop Zone Markings are Critical

If the aircrew can't find the DZ, the ground forces don't get their resupply. Locating a DZ and its' markings is dependent on many variables. Geographic location, atmospheric conditions, and placement of the markings on the drop zone are significant factors that affect the effectiveness of an airdrop and therefore need to be a prime consideration of ground personnel. Aircrew knowledge, experience, training, and thorough preparation are also factors contributing to mission success.¹

Coordinated timing, between the aircraft and ground personnel, for the display and deployment of acquisition aids is critical to the success of the mission. Ground personnel must assess the terrain, color of the surrounding environment, and estimate in-flight visibility conditions. Long-range acquisition aids (i.e. mirror flash) employed four minutes prior to the time over target (TOT) provide the best directional guidance. Since both identification and acquisition aids are dependent on the surrounding environment for effectiveness a combination of two to three different marking aids (i.e. mirror, RAM and smoke) is usually the most successful.²

The bottom line is that overall mission success is incumbent on aircrew experience, detailed pre-mission preparation, and trained drop zone control personnel who can assess the environment from an aircrew's perspective and orient and mark the DZ and PI accordingly.³ See Appendix A for a detailed explanation of drop zone markings.

Radio Procedures and Communications

AFI 13-217 states that, "to the maximum extent possible, airdrop operations should be planned to operate with minimum radio transmissions."⁴ This is a tactically sound idea, but it should not be interpreted to mean that the aircrew and ground parties do not have to have at least the capability available to communicate if necessary. It is imperative that the ground parties have a means to communicate with the airdrop aircraft during combat operations. Therefore, it also needs to be available and used during training exercises. More often than not, Army DZ operations are conducted without the capability to communicate verbally with the aircraft. This is unacceptable. In defense of the ground party, an interoperability problem exists between the Air Force and the Army. USAF aircraft normally operate on UHF, VHF and HF frequencies while the Army operates on FM and HF. Some later-model C-130 aircraft have FM capability but it is usually the problem of the Army maneuver units simply having the hardware to talk to the aircrews on any other frequencies. If the Army unit has a TALO with them, he will have the capability to communicate on UHF, VHF, HF and FM, and can assist the DZST. See Appendix A for detailed information on radio procedures and communications.

Drop Zone Coordination Checklist and Equipment Lists

The final part of the techniques section should include a checklist for DZ coordination and an equipment list for the DZCO and DZST. The coordination checklist will ensure that all the coordination items between the aircrew and ground party are discussed and coordinated. The equipment list will provide the ground party with a list of all the items required to control and airdrop.

Tactics

Field Manual 100-5, *Operations*, defines tactics as, "the art and science of employing available means to win battles and engagements. Tactics is battlefield problem solving usually rapid and dynamic in nature.⁵ To the drop zone controller, this means employing the "art and science" of drop zone control to get the mission accomplished.

As a minimum, three aspects of the "art and science" of drop zone control, Verbal Initiated Release System (VIRS), tactical drop zone surveys, and the use of the AN/PSN-11, Precision Lightweight GPS Receiver, should be covered in this section. Other aspects such as DZ security, and DZ concealment should be addressed. See Appendix A for a detailed explanation of the tactical aspects discussed above.

Capabilities and Limitations

Airdrop mission success can be enhanced if all the players involved understand each other's capabilities and limitations. The Air Force aircrew must know who the ground party is (i.e. CCT, TALO, Pathfinder or DZST) on the drop zone and what kind of support they can expect. They can then take into account their capabilities and limitations when they conduct their mission planning. It is essential that the ground party understand what the aircrew is doing during the airdrop mission. Most importantly, actions they take from the initial point (IP) to the DZ. This should preclude the ground party from interrupting the aircrew's coordination, within the aircraft, with extraneous radio calls. The ground party must have an appreciation for the skill required conducting airdrops and difficulty the aircrew sometimes has in seeing the ground markings. With this appreciation, they can more effectively control the airdrop. Who are the players in final leg of an airdrop mission? They are the aircrew and the ground party, and the ground

party can be CCT, a TALO, Pathfinder, or DZST. Each has specific capabilities and limitations. See Appendix A for a detailed explanation of each player.

Summary

VIRS needs to be included in the multiservice regulation because it is important for both the aircrew and ground party to understand. The aircrew must be knowledgeable in this procedure so they can perform it when called upon to do so. The ground party must know VIRS procedures to enhance their tactical capability and accurately control the airdrop. The tactical DZ survey is critical to airdrop mission success. The ground party must have the capability and skills to accurately perform and transmit the survey. The aircraft "can't get there from here" if this survey is not done correctly. Finally, the aircrew and ground party must know the capabilities and limitations of the people involved in airdrop missions so that they can plan and react accordingly.

Notes

¹ United States Air Force Airlift Center, Operational Feasibility Test and Evaluation of Marking only the Point of Impact for Container Delivery System Airdrops (Final Report: MAC Project 11-47-86). August 1988, vii

² Ibid., vii, 11

³ Ibid., v.

⁴ Ibid., 15.

⁵ Field Manual (FM) 100-5, *Operations*, 14 June 1993, 6-3.

Chapter 7

Conclusion

"Still the question recurs 'can we do better?' The dogmas of the quiet past are inadequate to the stormy present. The occasion is piled high with difficulty, and we must rise with the occasion. As our case is new, we must think anew, and act anew."

—Abraham Lincoln

The requirement to conduct successful airdrop operations in combat is not going away any time soon, if ever. Therefore we need to continue to provide the best possible training to our aircrews and drop zone controllers to be able to accomplish this mission.

The ability of the drop zone controller to locate, survey, mark, communicate and control the drop zone is vital to mission success. The aircrew must understand the capabilities and limitations of the particular ground party they will be working with. The current documents on drop zone control, AFI 13-217 and FM 57-220, are inadequate in meeting this goal. While adequate for the procedural aspects of drop zone control, they both lack information on the tactics and techniques of drop zone control.

The way to foster interoperability and put aircrews and drop zone controllers on the "same sheet of music" is to produce a multiservice drop zone control regulation which standardizes procedures and provides information on the "art" of drop zone control, in the way of tactics and techniques. Because the new regulation will cover tactics and techniques, as well as the procedural topics, it is not simply a duplication of AFI 13-217

and FM 57-220. It will be a brand new, information intensive, regulation for the joint warfighter. Then, to make this manual work, we must make it accessible to the troops that need it and portable enough to take with them, in their BDU or flight suit pocket.

Carl Von Clausewitz said, "Everything in war is simple, but the simplest thing is difficult." The difficulties accumulate and end by producing a kind of friction that is inconceivable unless one has experienced war.¹ To the unaided eye, the issue of drop zone control might be a simple task and not worthy of the effort required producing a useful document for the warfighter. Theater airlift and airdrop missions are one of those functions that people always tend to take for granted because they continually achieve success without many fanfares.² As a result, drop zone control does not receive a critical look. Headquarters, Air Mobility Command (AMC) estimates that, during a military operation, five to ten percent of all theater resupply movements (i.e. land and air) would be done by air. Of the air portions, ten percent would be by airdrop.³ We need to take a critical look at drop zone control and do everything we can to make it better and safer.

This estimate makes it absolutely necessary that aircrew and ground party members be thoroughly schooled in the procedures as well as the "art" of drop zone control. If drop zone control is not done correctly, there will be dire consequences and it can cost soldiers and airman their lives. If the aircrew cannot find the drop zone and are forced to delay in the threat area, they are put at unnecessary risk. If they don't drop their load, the troops on the ground do not get their resupply and they are put at risk. Their position is also exposed for longer than necessary, as they try to fix the problem and make the DZ suitable to drop on. Finally, valuable airlift resources are tied up and their efforts wasted if they can't drop on the first pass and have to go home without dropping their load. My

experience with drop zone control has shown that knowledge of procedures, tactics and techniques, that make drop zone control successful, is a perishable skill and we need to have a "user friendly" regulation to refresh our memory in the heat of battle.

Yes, Mr. Lincoln, we can do better.

Notes

¹ Carl Von Clausewitz, *On War*, trans. and ed. Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1984) p. 119.

² Zamzow, LTC Mark R. "Theater Airlift: Are We Realizing Its' Full Potential?" Research Report. Maxwell AFB, Ala.: Air War College, 1995.

³ Ibid.

Appendix A

Appendix A: Suggested Content for the Multiservice Drop Zone Control Regulation

Techniques

Day Drop Zone Markings

DZ and PI markings and aids are most effective if they provide DZ acquisition at greater than three miles and identification of the PI at no less than 3 miles.

Raised Angle Marker (RAM)

The raised angle marker (RAM), designed by the Royal Air Force (RAF), is the most preferred and effective day DZ and PI identification marking. The RAF version is the standard today and it stands 6 feet high, weighs 3 pounds, has five panels made of VS-17 panels, which forms a 1/3 cone configuration and is supported by a collapsible rod, metal stakes, and a guide cord. The material of the VS-17 panels is nylon taffeta, one side being international fluorescent orange and the other bright fluorescent pink.¹ AFI 13-217 gives additional information on the requirements for a RAM. It must be 6 feet high (minimum), 6 feet wide at the base (minimum), displayed at a 60-degree angle into the direction of flight.²

A common problem has been that the RAMs used are too small and too low to the ground that severely restricts the ability for the aircrew to see the PI. In addition, most of the RAMs used are not visible in a 360-degree view. The orange sides of the 5 VS-17 panels, when sewed together are only visible from one direction. This is fine for a rectangular or square DZ where the run-in heading is predetermined by the DZ survey but is ineffective on a circular DZ. A circular DZ, which allows the aircrew to determine the run-in heading, is more tactically sound and is preferred. Thus, a circular DZ requires a RAM that is visible from 360 degrees. Units with airdrop requirements can locally purchase a superb version of this type of RAM, called the "T-RAM,"

The "T-RAM" or tactical raised angle marker is manufactured and available from TAC-TEC Inc. Their current version is the "B-Model." Their RAM is bright orange; three sided, provides 360-degree visibility and can be seen from 5 to 10 miles out. When properly assembled it is 7 1/2 feet tall and 9 1/2 feet across the base and has a raise angle of 60 degrees from bottom to top and can withstand winds up to 25 miles per hour. It is secured at the base with three 9-inch tent stakes and uses a collapsible center pole. The entire package fits easily in a small tote bag and weighs about 3 pounds.³ It will fit nicely in a rucksack or in a drop zone kit.

Summary

This section has concentrated on the RAM as a day DZ marking but the final multiservice regulation should also include information on use of mirrors, space blanket, colored smoke, and coded, block letters of VS-17 panels.

Night Drop Zone Markings

Marking aids for night acquisition and identification are critical since it is an environment that poses the greatest challenge to DZ acquisition and alignment by the aircraft. During day operations, acquisition and identification are big players, but enough visual cues are available for the aircrew to solve the alignment problem. At night, has to deal not only with acquisition and identification, but also with alignment. The aircrew is often flying into a "black hole" at the DZ, so any aids to help them with alignment are appreciated (i.e. flanker lights and trailing edge lights). Night drop zone lighting creates problems for the drop zone support team as well. Light discipline is critical in a combat zone, so the DZSTL needs to find a compromise between providing sufficient lighting for the airdrop aircraft and minimizing its use to maintain the cover of darkness on the battlefield.

The Standard

AFI 13-217 directs that the PI will be marked with a block letter of lights, with the apex of the block letter located on the PI. The minimum size will be 35 feet by 35 feet and consist of at least nine white lights, with a recommended output rating of 15 candella. Flanker lights are optional, and if used, will be white and placed 200 meters abeam the PI. For actual personnel airdrops, an amber trailing edge beacon will be placed 1000 meters from the PI, along the surveyed line-of-flight, or at the DZ trailing edge, whichever is closer to the PI. Most important, the DZ identification must be coordinated and briefed to the ground party and the aircrew.⁴ FM 57-220 echoes the standard markings except it shows flanker lights as mandatory and describes the amber trailing edge beacon as an amber rotating beacon.⁵

Tactical Considerations

Light discipline will influence night DZ markings. If the DZST is suitably equipped and the aircrews are qualified and equipped, infrared lighting systems are an excellent option to overt lighting. This allows maximum lighting available to the aircrew but is also tactically sound for the ground party. It is imperative, with this option, that all appropriate participants are thoroughly briefed.⁶

Many other options are available also. They include shielding the overt lights on three sides so only the side towards the aircraft run-in heading is visible or placing the lights in shallow pits to prevent enemy ground observation. Since any markings may be used to mark the DZ, as long as all participants are briefed and concur, hand-held flashlights, vehicle headlights, fires, or flares may be used. Safety hazards must be considered with these markings however, as they subject the ground party to injury from the airdropped objects. This leads to another problem if the ground party has to signal a "no-drop" for any reason. To do this, they need to either communicate to the aircraft on the radio or turn off the lights. Since the control point for the airdrop is usually located well away from the PI and the lights, this would require someone to subject themselves to hazards to run to the lights and turn them off if they didn't have radio contact with the aircraft. Many of the DZSTs don't have radio contact with the aircraft.

The best compromises I have personally used are remote controlled ACR/L-32 field marker lights. The lights are very bright, making them visible to the aircrew from a long way off. The remote function, controlled by a FM radio, allows me to limit the time they are on, thus reducing my "signature" on the battlefield. I would turn them on at approximately the time the aircraft has turned inbound to the drop zone and turn them off as soon as the load is clear of the aircraft. This way the lights were only on for 5-10

minutes, reducing the chance of enemy observation and saving valuable battery power. If I had to call a "no-drop", I could simply turn off the lights from my control point, which is usually located 300 yards from the PI.

The Bottom Line

The bottom line, for night airdrops, is to use all available and tactically sound lighting to mark the DZ. The ground party must balance the tactical situation on the battlefield with the amount of lighting required by the aircrew. In my opinion, the more the better. If you can put out PI light, flanker lights, and a trailing edge light, do it! This gives the best chance for the aircrew to find and hit the PI. If the ground party tries to get too "tactical," and the aircrew can't find the PI, they subject the aircraft, aircrew and themselves to hostile fire. The ideal situation is for the aircraft to drop all its cargo, on the first pass. This allows the aircraft to escape and the ground party to quickly recover the airdropped load and evacuate the area.

Summary

This section of the multiservice regulation should cover all the methods of marking the DZ at night as well as the tactical considerations. Emphasis must be placed on the reduced ability of the aircrew to find the DZ and PI at night as well as the alignment problems they face. This drives the necessity for effective lighting. It is in the ground party's best interests to help the aircrew out as much as possible.

Radio Procedures and Communication

As long as the prebriefed DZ markings are in place and visible, the aircrew is cleared to drop and no radio communications are required. The system is designed that way so

unnecessary radio communications can be avoided and but it seems to have evolved to be the justification for the ground party not having to obtain the capability to talk to the aircraft. In a perfect world, the aircrew and ground party don't need to talk to each other, but when has a combat zone always provided the perfect situation? The ground party must have at least the capability to talk. This doesn't mean that they have to use it.

The capability to establish radio communication on the drop zone is imperative. Radio communication can update the aircrew of last minute DZ or PI changes or threatening situations. A lack of radio communications with friendly forces at the DZ could place the aircrew in threatening situations. If the ground unit was forced to move or the threat of hostile forces existed, then the lack of radio communications between Army forces and the aircraft may endanger operations⁷ The ground party is capable of determining surface wind conditions and can pass this information to the aircrew which will help the aircrew navigator adjust his CARP. Some training airdrops have certain conditions that make radio communications mandatory between the ground party and aircraft.

Summary

The multiservice regulation must stress the importance of obtaining the capability of communicating with the airdrop aircraft. Army units with an airdrop requirement can easily satisfy this need by purchasing a pair of PRC-113 radios which provides portable UHF and VHF capability. During exercises, the DZSTL must provide a DZ radio frequency to the airlift planners so they can practice talking to the aircraft. If they are limited to FM, pass that frequency anyway because the aircraft may be equipped with a FM radio. I have observed a great degree of complacency, with airdrop communications

during exercises and it will come back to hurt us. Air Force aircraft are used to talking to Air Force DZCOs during home-station training missions and the Army DZSTLs are used to not talking to the aircraft during joint exercise. This will be a real problem in the fluid environment of combat when we need to talk.

Tactics

VIRS

VIRS procedures are used when normal drop zone procedures are not tactically feasible. The ground party determines the desired release point, gives verbal steering guidance to the pilot to align the aircraft over that point, and then initiates the release of the load.⁸ If VIRS procedures are used, the ground party doesn't have to set up the normal drop zone markings which greatly reduces the "signature" of airdrop operations on the battlefield. This could result in a nearby enemy being completely unaware airdrop operations are about to take place. The ground party can determine the release point without exposing themselves, in the open of the drop zone, to enemy observation. At the last minute, they can move to the release point and direct the aircraft or they can remain concealed the entire time and direct the drop from a secure location.

The sophistication of equipment on airdrop aircraft has stirred a debate about the value of using VIRS. Surely the aircrew is more capable of determining an exact release point based on the highly accurate navigation equipment on board the aircraft. In fact, the aircrew alone knows the up-to-the-second altitude wind, aircraft altitude and track, and the actual weight and flight station of the rigged load - all factors used in precisely determining and navigating to the release point.⁹ All this is true, however, there is one

very important variable the aircrew cannot take into account - the highly mobile nature of modern ground combat. From the time the aircrew is handed the mission package to the time they arrive over the designated drop area may be a matter of several hours, and a company or battalion can move quite a distance in that time, rendering pre-flight drop information obsolete.¹⁰ Vietnam and Operation DESERT STORM proved this correct. Mobile troops, meeting less than anticipated resistances were moving at much faster than expected pace. The lag time between the airlift request, the initial plan, and actual drop time gave the ground troops anywhere from a few hours to nearly a day to change locations. In addition, with fratricide a constant concern, aerial recognition of friendly troops is a high priority item. We mark our vehicles with orange VS-17 panels, the same ones used to make a RAM. This causes the RAM to blend in with the many vehicles that may be in the vicinity of the drop zone. The bottom line is that VIRS gives the ground commander more options, protects the troops, and gives him the flexibility to change the plan at the last minute.

Who on the ground control VIRS drops and how can they accurately determine the release point? The person controlling the VIRS drop may be a TALO, combat controller or a qualified Army DZSTL, all of whom are equipped with sophisticated equipment to perform accurate airdrops. Handheld global positioning system receivers, night vision equipment, UHF/VHF, FM and HF radios, and wind meters for example. They also have one other advantage. While the aircraft may not be able to see the drop zone markings on the ground, the ground party can definitely see the airdrop aircraft in the air.¹¹

Tactical Drop Zone Survey

The ground party must provide a drop zone for the aircraft to drop on. There are two types of drop zone surveys; existing or complete surveys and the tactical survey. The Air Force lists all available drop zones approved for use in an Assault Zone Availability Report (AZAR). This AZAR identifies drop zones, landing zones, and extraction zones available in the continental United States (CONUS) and outside the CONUS used by AMC. The information for each drop zone is recorded on the Air Force Form 3823. The other type of survey is the tactical survey that is used only for contingency or wartime operations or a major training event such as JRTC. For the tactical survey, the DZSTL is expected to locate, assesses and get Air Force approval for a potential drop zone.¹² Many DZ selection factors go into the process of surveying a DZ.

The DZSTL must first consider the tactical commander's scheme of maneuver as to where to place his tactical drop zone. Then, he must assess the following factors for the airdrop aircraft. First is ease of identification from the air (will the aircraft be able to locate the DZ). Next he must ensure the selected DZ allows a straight-line approach of at least 10 miles to aid in accuracy of the airdrop. Next, is the DZ out of range of enemy air and ground defenses and if not, can the threat be minimized. Finally, weather and terrain must be considered from the aircraft's point of view (POV). Will low hanging clouds prevent acquisition of the DZ and will the terrain selected result in obstacles which could prevent the aircraft from identifying the PI.¹³ Once this is complete, he must assess the DZ from the ground party's POV.

First, the DZSTL must ensure the DZ is the correct size for the load being dropped and to do this he must take into consideration the drop altitude, type parachutes and the method of delivery. Next, is the DZ free of obstacles that could prevent the recovery of

the airdropped load? In addition, are there adequate ground routes to and from the DZ for the recovery team and equipment? Finally, can the ground unit provide security for the DZ and the DZST?¹⁴ Once the DZSTL determines the DZ's location, using the aforementioned selection factors, he must complete the survey of the DZ. This requires him to accurately record map serial numbers and sheet, aircraft approach axis in magnetic degrees, an eight digit grid for the PI, drop zone size, coordinates, description of any hazards and any other information which may be helpful to the aircrew.¹⁵

If it is critical that the DZ survey information is accurate. If it isn't, the airlift unit will have to send it back to the ground unit for clarification. This wastes time and resources and can affect the success of a mission. To get it right the first time, the DZSTL should use as many aids as possible. If the maneuver unit has a TALO assigned to them, he can assist the DZSTL in this task. If not, the DZSTL should use an AN/PSN-11 PLGR (hand-held GPS), computer software programs, which facilitate construction of the DZ, pre-sized templates, and a step-by-step checklist of all the information that the airlift unit needs to plan and execute the mission. This information can then be recorded on a tactical DZ survey form that is then transmitted to the Air Force approving authority. It should be mentioned here that there is no formal tactical DZ survey form, so each unit must design their own and it must meet the minimum requirements. Because of this, the multiservice regulation should include a suggested format for this form as well as step-by-step instructions on how to complete a tactical DZ survey and the form.

AN/PSN-11 Precision Lightweight GPS Receiver (PLGR)

The PLGR is a small, handheld, Global Positioning System (GPS) receiver featuring selective availability/antispooing (SA/A-s) and anti-jam capability. It provides precise

positioning and timing solutions based upon signals received from the GPS satellite constellation. It is a five channel receiver, capable of Precision Code (P Code) and Y Code (encrypted P Code) reception. Positioning solutions can be displayed in latitude-longitude, military grid reference system (MGRS), Universal Transverse Mercator (UTM) and many others. It contains 49 datums and can be programmed to support navigation. It is also night vision goggle (NVG) capable.¹⁶

The AN/PSN-11 PLGR is an invaluable tool for both VIRS and tactical DZ surveys. For VIRS it can be used to locate the PI and then calculate the "no-wind" and wind-corrected release points. This will allow the ground party to calculate these points from a safe location and avoid having to "pace-count" on an open DZ. The PLGR is also useful for determining precise grid coordinates for the PI and drop zone when performing a tactical survey. MGRS coordinates, which are most useful to the ground party, can be converted to latitude-longitude coordinates, which are more useful to the aircrew. Overall, the PLGR is a very handy tool and the ground party should be well versed in its operation.

Capabilities and Limitations

USAF Aircrew

This section would describe the actions the aircrew takes from takeoff to the DZ. It would give some information on the great amount of crew coordination it takes to pull off a successful airdrop. It can describe the effort it takes to see DZ markings and how radio calls can help or hinder the crew during the run-in to the DZ.

Combat Controllers

Combat Controllers (CCT) are the Air Force's version of Special Forces. Their mission is to deploy by the most feasible means - by air, land, or sea - into a hostile environment to establish assault zones (LZs and DZs) with air traffic control capabilities. They can place enroute and terminal navigation aids, provide air traffic control (ATC) and command and control capabilities and remove obstacles and unexploded ordinance with the use of demolitions.¹⁷ For airdrop missions, they can use parachuting, SCUBA, All-terrain vehicles, or plain old walking in to infiltrate an area before a large drop to set up and mark the drop zone. If an airfield was to be seized by an airborne drop, as in Operation JUST CAUSE, CCT would jump in with the assaulting force to set up a drop zone for follow-on forces and establish on-site friendly ATC to guide incoming transports that would be used to strengthen and resupply the airfield assault force.¹⁸ CCT personnel are limited in number and their capabilities, especially for air traffic control, are in demand around the world. Therefore, aircrew should only expect to have CCT controlling vital and large-scale airdrops (i.e. mass tactical personnel drops). They will usually not see CCT working a brigade or battalion resupply mission.

Theater Airlift Liaison Officer (TALO)

Theater Airlift Liaison Officers are highly qualified, rated airlift officers, with tactical (airdrop) airlift experience, assigned duties supporting US Army units. This officer is specially trained to implement the theater air control system (TACS) and to control tactical airlift assets.¹⁹ The TALO can control both day and night, joint and unilateral airdrops and will be equipped with a complete DZ kit. Therefore, they can provide the aircrew with excellent drop zone control support. TALOs, however, cannot

control landing zones, but may act as a landing zone safety officer (LZSO) there. TALOs are qualified in VIRS drops and proficient in tactical drop zone surveys. Some TALOs are also airborne qualified. TALOs provide superb continuity and coordination between Army and Air Force units because they are intimately familiar with both. Aircrews can expect to see TALO influence, on the drop zone, down to the brigade or regiment level, during exercises and contingencies.

Pathfinders

Pathfinders are US Army soldiers trained and equipped to select, mark, improve, and control landing sites and drop zones. They provide navigational assistance and air traffic advisories for Army aircraft. Soldiers become Pathfinder qualified by completing the Pathfinder Course at the US Army Infantry School, Fort Benning, GA. Ideally, a Pathfinder is assigned to each combat aviation battalion, but can be employed with any Army unit that requires major troop lift or airdrop operations. They can provide limited weather observation assistance and can perform DZ surveys and DZ control of Army and USAF aircraft. Pathfinders are usually equipped with excellent DZ and communication equipment (may be limited to FM)²⁰. Aircrews can expect excellent DZ service from Pathfinders.

Drop Zone Support Team (DZST)

The Drop Zone Support Team (DZST) can plan, establish, and operate day and night drop zones for personnel and resupply missions flown by Air Force and Army aircraft. In operations in which CCT is not present, the DZST has overall responsibility for the conduct of operations on the DZ. The DZST will have at least two members. More personnel may be required depending on the complexity of the mission. Only one

member of this team must be DZST qualified and that person is designated the Drop Zone Support Team Leader (DZSTL). He is responsible for the overall establishment and operation of the DZ. He selects the locations of the control center, point of impact, and release point. Primary missions of the DZST include wartime CDS drops to battalion or smaller size units, and peacetime visual meteorological conditions (VMC) airdrops involving one to three aircraft for personnel, CDS and heavy equipment. Secondary missions include wartime drops of brigade size or larger units, peacetime drops of C-130 all-weather aerial delivery system (AWADS) involving one to three aircraft, or VMC drops of four aircraft or more.²¹

DZSTs will be the most common DZ controllers' aircrews will see during resupply missions to Army units. They normally receive their DZ control training, at their home units, from mobile training teams (MTTs) from the Pathfinder School at Fort Benning, GA. This training is somewhat abbreviated; usually only lasting three days. It is not nearly as intensive as CCT, Pathfinder, or TALO DZ training. The result is that they will only be trained in the very "basics" of DZ control.

The DZST qualification is an additional duty for the soldier, so they don't often get the chance to practice their skills. He or she is usually a member of a Forward Support Battalion (FSB), supporting a brigade sized unit, or the Support Platoon Leader of a battalion sized unit. Therefore, they are busy with their primary duties and DZST duties interfere with that. When they go to the drop zone, they are often responsible for the setting up the security team, road guards, recovery teams and DZST. With this type of responsibility, things can sometimes fall through the cracks. Aircrews need to understand

this and be patient with them. They can expect minimum markings and probably no radio contact with the DZST.

This is not to imply that all DZSTs don't provide great DZ support to the aircrews. Many of them are very proficient and do a superb job. It just depends on the person running the DZ that day as to the amount of help they will get.

Notes

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¹⁹ Air Force Instruction (AFI) 13-217, *Assault Zone Procedures*, 1 June 1996, 39.

²⁰ Field Manual (FM) 57-38, *Pathfinder Operations*, 9 April 1993, 1-1, - 1-4.

²¹ Ibid.

Appendix B

Appendix B: Historical Background, Operation JUST CAUSE

Operation JUST CAUSE was a US military action taken in response to aggression by Panamanian ruler, General Manuel Noriega and his Panamanian Defense Forces (PDF). General Noriega had already been indicted by two Florida grand juries for involvement with drug cartels and Noriega was believed to be the instigator of harassment against Americans and American servicemen stationed in Panama. Tensions were high on both sides and the actions of PDF guards, stopping and arresting US servicemen for no reason provoked a reaction from the White House approving the use of military forces to remove Noriega from power. On 15 December 1989, at Noriega's instigation, the Panamanian National Assembly declared that a state of war existed between Panama and the United States and enacted measures to repel foreign aggression.¹ The killing of Marine Lieutenant Robert Paz on 16 December 1989, by PDF guards at a roadblock, was the trigger which caused President George Bush to order Operation JUST CAUSE. The objectives of JUST CAUSE were: remove General Manuel Noriega from power, protect American lives, restore democracy to Panama, and secure US treaty rights to the Panama Canal. H hour was set for 0100, 20 December 1989.²

The plan for Operation JUST CAUSE was to use overwhelming force to attack multiple locations at the same time.³ To accomplish this, soldiers would need to be airdropped into battle.

In the first hours of the operation, eighty-four Military Airlift Command (MAC) aircraft picked up some 3,500 Army Rangers and paratroopers, plus their equipment, at four US locations and headed towards drop zones in Panama. This was an extremely complicated operation, entailing the use of sixty-three C-141s and twenty-one C-130s in the initial deployment. The C-141s and C-130s deployed forces directly to drop zones at three separate locations in Panama. One drop zone was at Rio Hato airfield. At Tocumen International Airport, there were two personnel drop zones and two heavy equipment drop zones. The airdrops were conducted in concert with land and air operations carried out by US forces already stationed in Panama. MAC special operations aircraft and forces spearheaded the airdrop. Air Force combat controllers from various special operations units were inserted by MAC special operations aircraft to control the drop zones.⁴

Early on 20 December 1989, twelve C-141s and four Special Operations Low Level (SOLL) II C-130s began airdropping paratroopers and heavy equipment from the 75th Ranger Regiment on Torrijos/Tocumen Airport near Panama City. At the same time, fifteen C-130s executed an airdrop on Rio Hato, a major Panamanian Defense Force base and airfield.⁵ Soon, almost 4000 soldiers had parachuted onto the drop zones, securing the airfields at Tocumen and Rio, opening the way for follow-on forces and equipment to airland at the airports.

Operation JUST CAUSE was the largest US military operation since Vietnam. Similarly, the early morning airdrop on Torrijos/Tocumen and Rio Hato airfields constituted the largest personnel airdrop since Korea and the largest nighttime parachute assault in the history of airpower.⁶ Unlike many large airborne operations in World War II where paratroopers ended up dispersed far from their drop zones, these soldiers landed right in the intended areas. The drop zones were right on top of large enemy troop concentrations so there was no time for the enemy to organize strong resistance once US forces had landed.⁷ Success for the accuracy of the airdrops can be attributed to both the skill and finesse of the aircrews and the competence and courage of the combat controllers. Along with the normal drop zone markings, combat controllers ingeniously managed to turn on some of the navigation aids at the airports to aid the airdrop aircraft to line up with the drop zones.

The final success of Operation JUST CAUSE can be attributed to the effectiveness of the airlift and airdrop in deploying troops and equipment in rapid fashion.⁸ The airdrop assault was so swift that it succeeded in catching General Noriega and members of the PDF off guard. General Noriega was at the officer's club at the military side of Torrijos/Tocumen airport at 1 a.m. when the US Army Rangers began parachuting on the airfield. Noriega fled in his car.⁹ The restoration of democracy and the apprehension of General Noriega were a triumph for the concept of joint operations, as many intricately related assault operations occurred simultaneously at H-hour.¹⁰ The success and efficiency of airdrop operations was a deciding factor.

Notes

¹ Ibid., 195

Notes

² Captain Thomas J. Snyder, USAF and Captain Stella T. Smith, USAF, "Operation JUST CAUSE: Panama," *Air Force Journal of Logistics*, Vol. XXII, Um 1, 38.

³ Ibid.

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